U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
PB-279 105

Bear Lake, Rich County, Utah and Bear Lake County, Idaho

National Eutrophication Survey, Corvallis, Oreg

Prepared for

Corvallis Environmental Research Lab, Oreg

Sep 77

PB 279 105

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES

CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON

and

ENVIRONMENTAL MONITORING & SUPPORT LABORATORY - LAS VEGAS, NEVADA

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

P.O. 699-440

54

TECHNICAL REPORT DATA (Please read Instructions on the reverse before completing)		
1. REPORT NO.	2.	3. PB279105
4. TITLE AND SUBTITLE Report on Bear Lake, Rich County, Utah and Bear Lake County, Idaho		5. REPORT DATE Prepared September 1977 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Anonymous (National Eutrophication Survey Staff)		8. PERFORMING ORGANIZATION REPORT NO. Working Paper # 836
9. PERFORMING ORGANIZATION NAME AND ADDRESS National Eutrophication Survey U.S. Environmental Protection Agency 200 S. W. 35th St. Corvallis, Oregon 97330		10. PROGRAM ELEMENT NO. 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Office of Research and Development U.S. Environmental Protection Agency 401 M Street, S. W. Washington, DC 20460		13. TYPE OF REPORT AND PERIOD COVERED Final - 1975 14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES
Prepared in cooperation with the U.S. Environmental Protection Agency, National Environmental Research Center, Las Vegas, Nevada 89114

16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
eutrophication lakes nutrients phosphorus nitrogen loading		48G

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS (This Report)	21. NO. OF PAGES
Release unlimited		59
	20. SECURITY CLASS (This page)	22. PRICE PC A04 / MF A01

EPA Form 2220-1 (9-73)

REPORT
ON
BEAR LAKE
RICH COUNTY, UTAH,
AND
BEAR LAKE COUNTY, IDAHO

EPA REGION VIII

WORKING PAPER No. 836

WITH THE COOPERATION OF THE
UTAH STATE DIVISION OF HEALTH, THE
IDAHO DEPARTMENT OF HEALTH AND WELFARE,
AND THE UTAH AND IDAHO NATIONAL GUARD

SEPTEMBER, 1977

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Utah Department of Social Services, the Utah Department of Natural Resources, and the Idaho Department of Health and Welfare for professional involvement and to the Utah and Idaho National Guards for conducting the Bear Lake tributary sampling.

The staffs of the Bureau of Water Quality of the Utah Division of Health, the Utah Division of Wildlife Resources, and the Idaho Division of Environment provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary report, and provided critiques most useful in the preparation of this Working Paper.

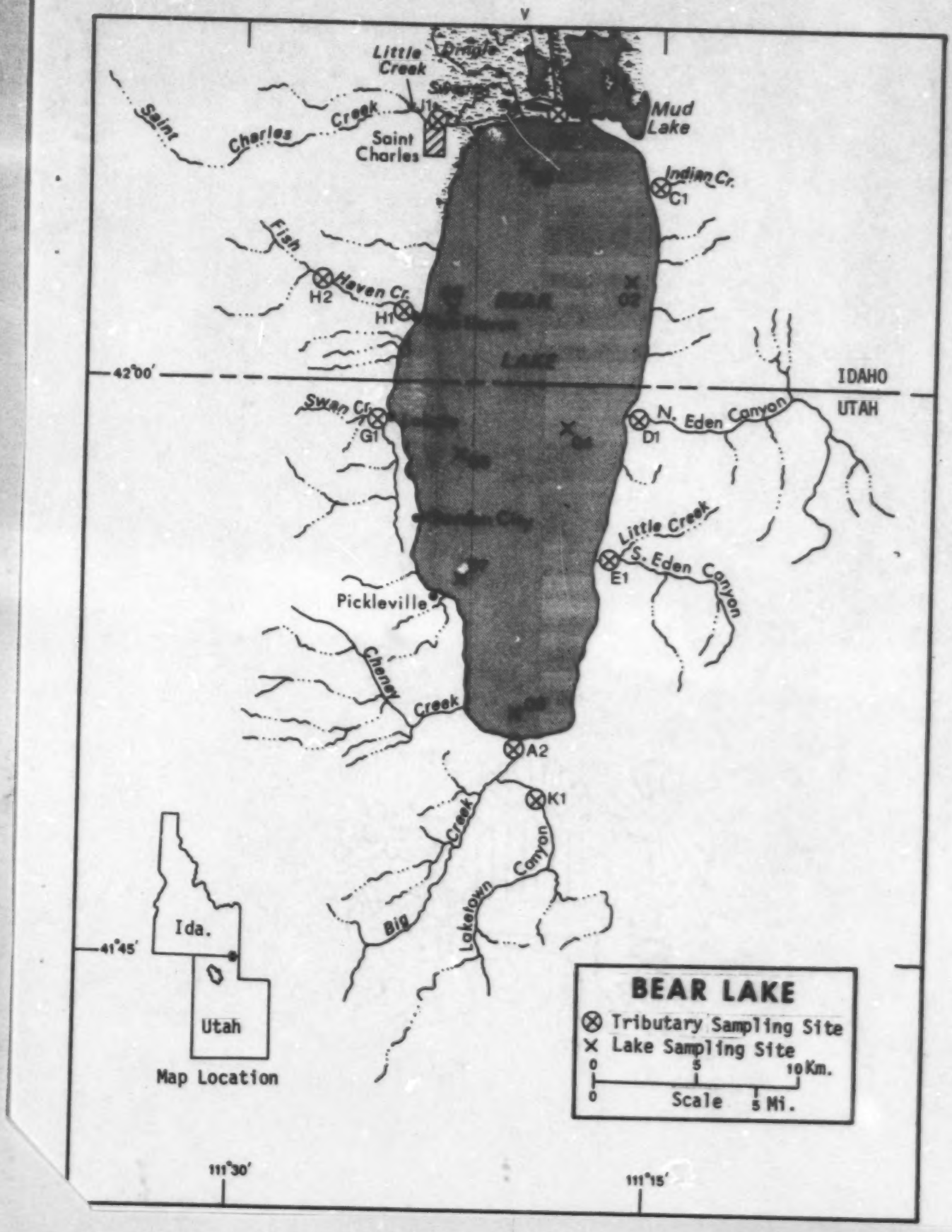
Major General Maurice L. Watts, the Adjutant General of Utah; Major General James S. Brooks, the Adjutant General of Idaho; and Project Officers Lt. Colonel T. Ray Kingston and Major Vestal L. Baker, who directed the volunteer efforts of the Utah and Idaho National Guardsmen, respectively, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES AND RESERVOIRS

STATE OF UTAH

NAME	COUNTY
Bear	Rich, UT; Bear Lake, ID
Deer Creek	Wasatch
Echo	Summit
Fish	Sevier
Flaming Gorge	Daggett, UT; Sweetwater, WY
Huntington	Emery
Joes Valley	Emery
Lower Bowns	Garfield
Lynn	Box Elder
Minersville	Beaver
Moon	Duchesne
Navajo	Kane
Newcastle	Iron
Otter Creek	Piute
Panguich	Garfield
Pelican	Uintah
Pineview	Weber
Piute	Piute
Porcupine	Cache
Powell	Garfield, Kane, San Juan, UT; Coconino, AZ
Pruess	Millard
Sevier Bridge	Juab, Sanpete
Starvation	Duchesne
Steinaker	Uintah
Tropic	Garfield
Utah	Utah
Willard Bay	Box Elder


Little Creek
Dingle
Mud Lake
Saint Charles Creek
Saint Charles
J1
Indian Cr.
C1
Fish
Haven Cr.
H2
H1
BEAR LAKE
42°00'
IDAHO
UTAH
Swan Cr.
G1
N. Eden Canyon
D1
Little Creek
S. Eden Canyon
E1
Pickleville
Cheney Creek
A2
K1
Big Creek
Lokelown Canyon
41°45'
Ida.
Utah
Map Location
111°30'
111°15'
BEAR LAKE
Tributary Sampling Site
Lake Sampling Site
0 5 10 Km.
0 Scale 5 Mi.

BEAR LAKE

STORET NO. 4901

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Bear Lake is oligotrophic. It ranked first in overall trophic quality when the 27 Utah lakes sampled in 1975 were compared using a combination of six water quality parameters*. Two lakes had less and two had the same median total phosphorus, one had less and three had the same median dissolved orthophosphorus, none had less and ten had the same median inorganic nitrogen, none had less mean chlorophyll a, and only one other lake had a greater mean Secchi disc transparency. Survey limnologists did not observe any nuisance conditions on the lake during the three sampling visits. No significant depression of dissolved oxygen with depth occurred at any of the sampling stations or times.

B. Rate-Limiting Nutrient:

Because of nutrient changes in the samples, the algal assay results are not representative of conditions in the lake at the times the samples were collected (05/14/75 and 09/19/75). The lake data indicate nitrogen limitation at all stations in May; nitrogen limitation at stations 1, 5, and 6 but phosphorus limitation at stations 2, 3, 4, and 7 in August; and phosphorus limitation at all stations except station 3 in September.

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* See Appendix A.

C. Nutrient Controllability:

1. Point sources--No known municipal or industrial wastewater treatment plants impacted Bear Lake during the sampling year. Lakeshore septic tanks contributed an estimated 0.7% of the total phosphorus load, but a shoreline survey would have to be done to determine the actual significance of those sources.

The present phosphorus loading of 0.09 $g/m^2/yr$ is less than that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading but is more than his suggested oligotrophic loading; i.e., it is a mesotrophic loading (see page 14).

If the existing oligotrophic characteristics of Bear Lake are considered desirable, the loading should be reduced to the oligotrophic loading level. If the present loading continues, mesotrophic characteristics such as hypolimnetic depression or depletion of dissolved oxygen will become increasingly evident. However, changes in the trophic condition of the lake will not be rapid or readily obvious on a year-to-year basis because of the large volume of the lake and the lengthy mean hydraulic retention time of nearly 22 years.

2. Non-point sources--Non-point sources contributed 99.3% of the total phosphorus load to Bear Lake during the sampling year. Pumped return-flow loads from the outlet channel (station A-1) contributed 48.1%, Big Creek contributed 9.5%, North Eden Canyon

contributed 6.2%, Unnamed Creek E-1 contributed 5.3%, and the four other gaged tributaries collectively contributed 5.5% of the total. Ungaged minor tributaries and immediate drainage contributed an estimated 4.3%.

The Utah Power and Light Company operates the Lifton Pumping Station at the outlet to return water from the outlet channel and Dingle Swamp for peak power generation (Cogger, 1976). Since the phosphorus load contributed by this operation is the major addition to the total phosphorus loading of Bear Lake at the present time, any reduction in pumpage would lessen the nutrient enrichment of the lake.

In previous studies it has been noted that local land-use practices may also contribute nutrients (Anonymous, 1975). Survey data indicate that while the tributaries have relatively high total phosphorus concentrations, the low or intermittant flows in most of these streams result in relatively minor non-point contributions. However, periodic heavy runoff could increase the loads in the streams, depending on the kind of land-use practice involved. Further study would be necessary to determine the controllability of phosphorus contributions resulting from land-use practices in the lake drainage.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS†

A. Lake Morphometry††:

1. Surface area: 171.59 kilometers².
2. Mean depth: 10.2 meters.
3. Maximum depth: 63.4 meters.
4. Volume: 1,750,218 x 10^6 m³.
5. Mean hydraulic retention time: 21.9 years.

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
Big Creek	246.0	0.530
Indian Creek	11.7	0.006
N. Eden Canyon	137.3	0.317
Unnamed Creek E-1	59.6	0.137
Swan Creek	10.1	0.510
Fish Haven Creek	31.1	0.096
Little Creek	93.2	0.200
Minor tributaries & immediate drainage -	270.2	0.750
Totals	859.2	2.546

2. Outlet -

Outlet channel (A-1)	1,030.8**	2.530

C. Precipitation***:

1. Year of sampling: 29.2 centimeters.
2. Mean annual: 29.4 centimeters.

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† Table of metric conversions--Appendix B.
†† Sudweeks, 1975.
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Includes area of lake.
*** See Working Paper No. 175.

III. LAKE WATER QUALITY SUMMARY

Bear Lake was sampled three times during the open-water season of 1975 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from two or more depths at seven stations on the lake (see map, page v). During each visit, a single depth-integrated (4.6 m or near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the May and September visits, 18.9-liter depth-integrated samples were composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 2.7 meters at station 1, 32.3 meters at station 2, 7.9 meters at station 3, 47.5 meters at station 4, 31.1 meters at station 5, 24.7 meters at station 6, and 26.2 meters at station 7.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR BEAR LAKE
STORET CODE 4901

PARAMETER	1ST SAMPLING (5/14/75) 7 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (8/ 6/75) 7 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (9/19/75) 7 SITES RANGE	MEAN	MEDIAN
TEMP (C)	3.1 - 8.7	4.8	4.0	5.6 - 21.4	16.6	20.7	2.5 - 14.5	11.3	14.2
DISS OXY (MG/L)	8.4 - 10.4	10.0	10.0	5.0 - 9.6	7.7	7.4	5.8 - 10.0	8.0	7.8
CNDCTVY (MCROMO)	436. - 515.	463.	454.	436. - 695.	612.	664.	528. - 741.	662.	704.
PH (STAND UNITS)	8.3 - 8.8	8.7	8.8	8.6 - 9.0	8.9	8.8	8.5 - 8.8	8.7	8.8
TOT ALK (MG/L)	310. - 406.	367.	370.	306. - 550.	379.	362.	348. - 404.	380.	378.
TOT P (MG/L)	0.008 - 0.117	0.015	0.011	0.007 - 0.016	0.010	0.010	0.012 - 0.035	0.024	0.023
ORTHO P (MG/L)	0.002 - 0.040	0.007	0.006	0.002 - 0.009	0.004	0.002	0.002 - 0.004	0.002	0.002
NO2+NO3 (MG/L)	0.020 - 0.040	0.021	0.020	0.020 - 0.020	0.020	0.020	0.020 - 0.020	0.020	0.020
AMMONIA (MG/L)	0.020 - 0.040	0.021	0.020	0.020 - 0.030	0.021	0.020	0.020 - 0.020	0.020	0.020
KJEL N (MG/L)	0.200 - 0.600	0.303	0.300	0.200 - 0.300	0.213	0.200	0.200 - 0.200	0.200	0.200
INORG N (MG/L)	0.040 - 0.070	0.042	0.040	0.040 - 0.050	0.041	0.040	0.040 - 0.040	0.040	0.040
TOTAL N (MG/L)	0.220 - 0.630	0.324	0.320	0.220 - 0.320	0.233	0.220	0.220 - 0.220	0.220	0.220
CHLRPYL A (UG/L)	0.5 - 1.1	0.9	1.0	0.5 - 0.7	0.6	0.6	0.5 - 1.3	0.9	1.0
SECCHI (METERS)	1.8 - 4.6	3.4	3.7	2.4 - 15.2	7.9	7.3	2.7 - 6.2	4.8	4.9

B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera	Algal Units per ml
05/14/75	1. Ankistrodesmus sp.	1,003
	2. Chroomonas sp.	56
	Total	1,059
08/06/75	1. Lagerheimia sp.	95
	2. Kirchneriella sp.	95
	3. Cryptomonas sp.	48
	4. Oscillatoria sp.	48
	Total	285
09/19/75	1. Lyngbya sp.	181
	2. Oocystis sp.	181
	3. Elakatothrix sp.	135
	4. Chroomonas sp.	135
	Total	632

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
05/14/75	1	0.5
	2	0.7
	3	1.0
	4	1.0
	5	0.8
	6	1.1
	7	1.0
08/06/75	1	0.5
	2	0.6
	3	0.6
	4	0.6
	5	0.6
	6	0.7
	7	-
09/19/75	1	0.5
	2	0.7
	3	0.6
	4	1.3
	5	1.0
	6	1.1
	7	1.2

C. Limiting Nutrient Study:

The algal assay results are not considered representative of conditions in the lake at the time of sampling (05/14/75 and 09/19/75) due to significant changes in nutrients in the samples during shipment from the field to the laboratory.

The lake data indicate nitrogen limitation at all stations in May and a combination of limiting nutrients in August and September. Following is a tabulation of the mean inorganic nitrogen/orthophosphorus ratios at each of the sampling stations and times with the indicated limiting nutrient in parentheses.

Station	05/14/75	08/06/75	09/19/75
1	4/1 (N)	12/1 (N)	20/1 (P)
2	4/1 (N)	16/1 (P)	17/1 (P)
3	4/1 (N)	18/1 (P)	12/1 (N)
4	10/1 (N)	14/1 (P)	18/1 (P)
5	7/1 (N)	8/1 (N)	18/1 (P)
6	7/1 (N)	6/1 (N)	18/1 (P)
7	7/1 (N)	20/1 (P)	15/1 (P)

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Utah and Idaho National Guards collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the months of May through August when two samples were collected at one or more of the sites. Sampling was begun in October, 1974, and was completed in September, 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Utah District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were calculated using mean annual concentrations and mean annual flows. Nutrient loadings for the outlet channel (station A-1) below Lifton Pumping Station were calculated using normalized monthly flows and mean nutrient concentrations. Negative flows (pumped return flows) are shown as an additional inlet to the lake and positive flows as the amount leaving the lake (see Appendix C).

Nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the mean concentrations in Swan Creek at station G-1 and the mean annual ZZ flow.

A. Waste Sources:

1. Known municipal - None
2. Known industrial - None

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/yr	% of total
a. Tributaries (non-point load) -		
Pumped return flow	7,085	48.1
Big Creek	1,405	9.5
Indian Creek	60	0.4
N. Eden Canyon	920	6.2
Unnamed Creek E-1	780	5.3
Swan Creek	435	3.0
Fish Haven Creek	125	0.8
Little Creek	190	1.3
b. Minor tributaries & immediate drainage (non-point load) -	640	4.3
c. Known municipal STP's - None	-	
d. Septic tanks* -	95	0.7
e. Known industrial - None	-	
f. Direct precipitation** -	3,005	20.4
Total	14,740	100.0

2. Outputs -

Lake outlet - Outlet channel (A-1) 4,925

3. Net annual P accumulation - 9,815 kg.

* Estimate based on 330 lakeshore dwellings; see Working Paper No. 175.
** See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/yr	% of total
a. Tributaries (non-point load) -		
Pumped return flow	227,550	48.3
Big Creek	20,275	4.3
Indian Creek	670	0.1
N. Eden Canyon	5,730	1.2
Unnamed Creek E-1	4,235	0.9
Swan Creek	6,335	1.4
Fish Haven Creek	2,350	0.5
Little Creek	5,790	1.2
b. Minor tributaries & immediate drainage (non-point load) -	9,320	2.0
c. Known municipal STP's - None	-	-
d. Septic tanks* -	3,515	0.8
e. Known industrial - None	-	-
f. Direct precipitation** -	185,250	39.3
Total	471,020	100.0

2. Outputs -

Lake outlet - Outlet channel (A-1)	124,190

3. Net annual N accumulation - 346,830 kg.

* Estimate based on 330 lakeshore dwellings; see Working Paper No. 175.
** See Working Paper No. 175.

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km²/yr	kg N/km²/yr
Big Creek	6	82
Indian Creek	5	57
N. Eden Canyon	7	42
Unnamed Creek E-1	13	71
Swan Creek	43	627
Fish Haven Creek	4	76
Little Creek	2	62

E. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	0.09	0.06	2.7	2.0

Vollenweider phosphorus loadings ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Bear Lake:	
"Dangerous" (eutrophic loading)	0.14
"Permissible" (oligotrophic loading)	0.07

V. LITERATURE REVIEWED

Anonymous, 1975. A background inventory of Bear Lake Valley. Applied EcoSystems, Salt Lake City.

Cogger, Bill, 1976. Personal communication (Lifton pumping station). S & A Divn., EPA Region VIII, Denver.

Sudweeks, Calvin K., 1975. Personal communication (lake morphometry). UT Bur. of Env. Health, Salt Lake City.

Vollenweider, R. A., and P. J. Dillon, 1974. The application of the phosphorus loading concept to eutrophication research. Natl. Res. Council of Canada Publ. No. 13690, Canada Centre for Inland Waters, Burlington, Ontario.

VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
0404	LAKE POWELL	0.010	0.410	339.630	3.081	13.800	0.007
4901	BEAR LAKE	0.011	0.040	253.167	0.945	9.200	0.003
4902	LOWER BOWN'S RESERVOIR	0.031	0.040	336.000	5.567	9.400	0.006
4903	DEER CREEK RESERVOIR	0.038	0.215	430.333	9.078	14.800	0.006
4904	ECHO RESERVOIR	0.047	0.170	450.333	6.967	14.000	0.012
4905	LYNN RESERVOIR	0.121	0.200	417.667	39.600	10.400	0.052
4906	FISH LAKE	0.023	0.040	152.000	12.483	10.400	0.004
4907	HUNTINGTON NORTH RESERVO	0.013	0.040	392.000	1.900	7.800	0.005
4908	JOE'S VALLEY RESERVOIR	0.012	0.045	400.000	2.483	11.200	0.003
4909	MINERSVILLE RESERVOIR	0.192	0.060	445.000	33.583	8.600	0.107
4910	MOON LAKE	0.008	0.040	381.000	2.700	9.600	0.002
4911	NAVAJO LAKE	0.016	0.040	368.000	2.000	6.000	0.003
4912	NEWCASTLE RESERVOIR	0.051	0.040	428.667	12.467	13.600	0.009
4913	OTTER CREEK RESERVOIR	0.067	0.040	453.667	11.767	10.600	0.033
4914	PANGUITCH LAKE	0.071	0.040	426.500	45.950	14.200	0.010
4915	PELICAN LAKE	0.044	0.050	438.500	6.350	8.400	0.004
4916	PINEVIEW RESERVOIR	0.028	0.300	435.083	5.692	14.600	0.006
4917	PIUTE RESERVOIR	0.047	0.150	482.625	25.329	11.600	0.007
4918	PORCUPINE RESERVOIR	0.025	0.110	440.000	7.860	12.400	0.011
4919	PRUESS RESERVOIR (GARRIS	0.057	0.140	491.000	4.533	8.800	0.008
4920	SEVIER BRIDGE RESERVOIR	0.026	0.355	449.778	18.222	12.400	0.008
4921	STARVATION RESERVOIR	0.016	0.040	394.583	5.675	13.200	0.004
4922	STEINAKER RESERVOIR	0.011	0.040	316.750	1.844	12.600	0.005
4923	TROPIC RESERVOIR	0.021	0.050	425.000	7.200	8.400	0.006
4924	UTAH LAKE	0.132	0.320	490.583	72.012	11.400	0.012
4925	WILLARD BAY RESERVOIR	0.044	0.060	457.182	7.567	11.000	0.009
5605	FLAMING GORGE RESERVOIR	0.011	0.690	285.636	2.500	10.400	0.003

FREE BOOK

SEE APPENDICES

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
0408	LAKE POWELL	96 (25)	4 (1)	81 (21)	73 (19)	15 (4)	42 (11)	311
4901	BEAR LAKE	90 (23)	87 (19)	96 (25)	100 (26)	77 (20)	90 (23)	540
4902	LOWER BOWN'S RESERVOIR	46 (12)	87 (19)	85 (22)	65 (17)	73 (19)	50 (13)	406
4903	DEER CREEK RESERVOIR	42 (11)	19 (5)	42 (11)	35 (9)	0 (0)	58 (14)	196
4904	ECHO RESERVOIR	31 (8)	27 (7)	19 (5)	50 (13)	12 (3)	13 (3)	152
4905	LYNN RESERVOIR	8 (2)	23 (6)	58 (15)	8 (2)	62 (15)	4 (1)	163
4906	FISH LAKE	62 (16)	65 (16)	100 (26)	23 (6)	62 (15)	79 (20)	391
4907	HUNTINGTON NORTH RESERVO	77 (20)	65 (16)	69 (18)	92 (24)	96 (25)	69 (18)	468
4908	JOE'S VALLEY RESERVOIR	81 (21)	58 (15)	62 (16)	85 (22)	46 (12)	96 (25)	428
4909	MINERSVILLE RESERVOIR	0 (0)	44 (11)	27 (7)	12 (3)	85 (22)	0 (0)	168
4910	MOON LAKE	100 (26)	87 (19)	73 (19)	77 (20)	69 (18)	100 (26)	506
4911	NAVAJO LAKE	69 (18)	87 (19)	77 (20)	88 (23)	100 (26)	85 (22)	506
4912	NEWCASTLE RESERVOIR	23 (6)	87 (19)	46 (12)	27 (7)	19 (5)	27 (7)	229
4913	OTTER CREEK RESERVOIR	15 (4)	87 (19)	15 (4)	31 (8)	54 (14)	8 (2)	210
4914	PANGUITCH LAKE	12 (3)	65 (16)	50 (13)	4 (1)	8 (2)	23 (6)	162
4915	PELICAN LAKE	37 (9)	54 (14)	35 (9)	54 (14)	90 (23)	73 (19)	343
4916	PINEVIEW RESERVOIR	50 (13)	15 (4)	38 (10)	58 (15)	4 (1)	58 (14)	223
4917	PIUTE RESERVOIR	27 (7)	31 (8)	8 (2)	15 (4)	38 (10)	46 (12)	165
4918	PORCUPINE RESERVOIR	58 (15)	38 (10)	31 (8)	38 (10)	33 (8)	19 (5)	217
4919	PRUESS RESERVOIR (GARRIS	19 (5)	35 (9)	0 (0)	69 (18)	81 (21)	37 (9)	241
4920	SEVIER BRIDGE RESERVOIR	54 (14)	8 (2)	23 (6)	19 (5)	33 (8)	37 (9)	174
4921	STARVATION RESERVOIR	73 (19)	87 (19)	65 (17)	62 (16)	23 (6)	79 (20)	389
4922	STEINAKER RESERVOIR	85 (22)	87 (19)	88 (23)	96 (25)	27 (7)	65 (17)	448
4923	TROPIC RESERVOIR	65 (17)	50 (13)	54 (14)	46 (12)	90 (23)	58 (14)	363
4924	UTAH LAKE	4 (1)	12 (3)	4 (1)	0 (0)	42 (11)	13 (3)	75
4925	WILLARD BAY RESERVOIR	37 (9)	44 (11)	12 (3)	42 (11)	50 (13)	31 (8)	216
5605	FLAMING GORGE RESERVOIR	90 (23)	0 (0)	92 (24)	81 (21)	62 (15)	90 (23)	415

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	4901	BEAR LAKE	540
2	4911	NAVAJO LAKE	506
3	4910	MOON LAKE	506
4	4907	HUNTINGTON NORTH RESERVO	468
5	4922	STEINAKER RESERVOIR	448
6	4908	JOE'S VALLEY RESERVOIR	428
7	5605	FLAMING GORGE RESERVOIR	415
8	4902	LOWER BOWN'S RESERVOIR	406
9	4906	FISH LAKE	391
10	4921	STARVATION RESERVOIR	389
11	4923	TROPIC RESERVOIR	363
12	4915	PELICAN LAKE	343
13	0408	LAKE POWELL	311
14	4919	PRUESS RESERVOIR (GARRIS	241
15	4912	NEWCASTLE RESERVOIR	229
16	4916	PINEVIEW RESERVOIR	223
17	4918	PORCUPINE RESERVOIR	217
18	4925	WILLARD BAY RESERVOIR	216
19	4913	OTTER CREEK RESERVOIR	210
20	4903	DEER CREEK RESERVOIR	196
21	4920	SEVIER BRIDGE RESERVOIR	174
22	4909	MINERSVILLE RESERVOIR	168
23	4917	PIUTE RESERVOIR	165
24	4905	LYNN RESERVOIR	163
25	4914	PANGUITCH LAKE	162
26	4904	ECHO RESERVOIR	152
27	4924	UTAH LAKE	75

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR UTAH 05/10/76

LAKE CODE 4901 BEAR LAKE

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 1030.8

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEA
4901A1	1030.8	3.964	-1.642	-3.398	-28.317	-28.034	-19.255	19.255	32.281	19.255	19.255	7.079	8.495	2.5
4901A2	246.0	0.51	0.57	0.71	0.42	1.30	0.54	0.28	0.20	0.23	0.25	0.62	0.71	0.5
4901C1	11.7	0.006	0.006	0.006	0.008	0.008	0.003	0.003	0.003	0.003	0.006	0.011	0.008	0.0
4901D1	137.3	0.198	0.170	0.113	0.368	0.906	0.765	0.368	0.085	0.142	0.283	0.198	0.198	0.3
4901E1	59.6	0.085	0.057	0.057	0.170	0.396	0.340	0.170	0.028	0.057	0.113	0.085	0.085	0.1
4901G1	10.1	0.57	0.48	0.28	0.85	1.05	0.93	0.28	0.17	0.14	0.34	0.48	0.51	0.5
4901H1	31.1	0.085	0.057	0.057	0.028	0.142	0.396	0.028	0.006	0.011	0.142	0.085	0.113	0.0
4901H2	25.9	0.085	0.057	0.057	0.142	0.878	0.934	0.340	0.227	0.170	0.142	0.085	0.113	0.2
4901J1	93.2	0.170	0.142	0.085	0.283	0.198	0.595	0.170	0.057	0.113	0.227	0.170	0.198	0.2
4901K1	62.2	0.020	0.023	0.020	0.045	0.040	0.065	0.065	0.051	0.057	0.025	0.023	0.023	0.0
4901ZZ	248.6	0.65	0.62	0.54	0.88	1.70	1.50	0.57	0.25	0.28	0.59	0.68	0.76	0.7

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 1030.8
SUM OF SUB-DRAINAGE AREAS = 925.7

TOTAL FLOW IN = 34.21
TOTAL FLOW OUT = 28.94

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4901A1	10	74	-1.359	19	-3.115				
	11	74	-4.531	24	-2.549				
	12	74	13.875	8	9.061				
	1	75	11.044	13	9.061				
	2	75	-5.897	28	-6.230				
	3	75	-5.663	22	-4.814				
	4	75	-9.628	14	-5.663				
	5	75	-22.370	5	-25.485				
	6	75	-48.422	9	-33.414	25	-35.679		
	7	75	-13.309	11	-11.610	23	-5.097		
	8	75	23.220	4	4.814				
	9	75	28.883	19	17.273				
4901A2	11	74	0.510	9	0.850				
	12	74	0.595	14	0.793				
	1	75	0.481	11	0.481				
	2	75	0.538	8	0.538				
	3	75	0.821	8	0.793				
	4	75	0.368	5	0.566				
	5	75	0.991	3	0.142	17	2.265		
	6	75	0.821	9	0.850	16	0.906		
	7	75	0.595	12	0.651				
	8	75	0.368	9	0.396				
	9	75	0.368	12	0.368				
	10	75	0.170	3	0.142				

TRIBUTARY FLOW INFORMATION FOR UTAH 05/10/76

LAKE CODE 4901 BEAR LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4901C1	10	74	0.006	19	0.003				
	11	74	0.008	24	0.008				
	12	74	0.006	8	0.006				
	1	75	0.006	13	0.006				
	2	75	0.006	28	0.006				
	3	75	0.006	22	0.008				
	4	75	0.008	14	0.008				
	5	75	0.008	5	0.008				
	6	75	0.006	9	0.006	25	0.006		
	7	75	0.006	11	0.006	23	0.006		
	8	75	0.006	4	0.008				
	9	75	0.003	19	0.003				
4901D1	11	74	0.142						
	12	74	0.142						
	1	75	0.142						
	2	75	0.113						
	3	75	0.142						
	4	75	0.368						
	5	75	0.850						
	6	75	1.161						
	7	75	0.934						
	8	75	0.283						
	9	75	0.283						
	10	75	0.255						
4901E1	11	74	0.057						
	12	74	0.057						
	1	75	0.057						
	2	75	0.057						
	3	75	0.057						
	4	75	0.170						
	5	75	0.368						
	6	75	0.510						
	7	75	0.396						
	8	75	0.113						
	9	75	0.113						
	10	75	0.113						
4901G1	11	74	0.566	9	0.595				
	12	74	0.623	14	0.651				
	1	75	0.708	13	0.708				
	2	75	0.566	8	0.566				
	3	75	0.368	8	0.510				
	4	75	0.765	5	0.991				
	5	75	0.765	2	0.708	17	1.274		
	6	75	1.699	16	2.549				
	7	75	0.566	12	0.623				
	8	75	0.283	9	0.311				
	9	75	0.170	12	0.198				
	10	75	0.227	3	0.255				

23

TRIBUTARY FLOW INFORMATION FOR UTAH 05/10/76

LAKE CODE 4901 BEAR LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4901M1	10	74	0.057	19	0.113				
	11	74	0.113	24	0.113				
	12	74	0.113	8	0.113				
	1	75	0.085	13	0.085				
	3	75	0.057	22	0.057				
	4	75	0.008	14	0.008				
	5	75	0.113	5	0.142				
	6	75	0.651	9	1.416	25	0.566		
	7	75	0.085	11	0.113	23	0.085		
	8	75	0.003	4	0.003				
	9	75	0.028	19	0.028				
4901M2	10	74	0.057						
	11	74	0.113						
	12	74	0.113						
	1	75	0.085						
	2	75	0.085						
	3	75	0.057						
	4	75	0.085						
	5	75	0.538						
	6	75	1.359						
	7	75	0.595						
	8	75	0.283						
	9	75	0.227						
4901J1	10	74	0.113	19	0.113				
	11	74	0.170	24	0.170				
	12	74	0.198	8	0.198				
	1	75	0.170	13	0.170				
	2	75	0.170	28	0.170				
	3	75	0.085	22	0.113				
	4	75	0.227	14	0.198				
	5	75	0.142	5	0.170				
	6	75	0.963	9	0.991	25	0.991		
	7	75	0.340	11	0.453	23	0.283		
	8	75	0.057	4	0.227	16	0.198		
	9	75	0.142	19	0.142				
4901K1	11	74	0.023						
	12	74	0.023						
	1	75	0.020						
	2	75	0.023						
	3	75	0.020						
	4	75	0.031						
	5	75	0.023						
	6	75	0.096						
	7	75	0.113						
	8	75	0.062						
	9	75	0.065						
	10	75	0.028						

TRIBUTARY FLOW INFORMATION FOR UTAH 05/10/76

LAKE CODE 4901 BEAR LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4901ZZ	11	74	0.680						
	12	74	0.708						
	1	75	0.680						
	2	75	0.651						
	3	75	0.680						
	4	75	0.793						
	5	75	1.359						
	6	75	2.435						
	7	75	1.218						
	8	75	0.481						
	9	75	0.481						
	10	75	0.425						

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 75/05/10

490101
42 06 12.0 111 20 07.0 3
BEAR LAKE
16007 UTAH

150791

11EPALES 2111202
0009 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/14	11	10 0000	8.6	8.6	72	515	8.75	312	0.840	0.600	0.030	0.017
	11	10 0005	7.8	9.4		505	8.75	332	0.030	0.400	0.020K	0.012
75/08/06	08	05 0000	20.9	8.0	96	663	8.80	324	0.020	0.300	0.020K	0.005
	08	05 0005	20.9	5.0		665	8.80	372	0.020	0.300	0.020K	0.003
	08	05 0009	20.9	7.4		667	8.80	306	0.020	0.200	0.020K	0.002
75/09/19	12	45 0000	13.5	9.6	>108	691	8.70	396	0.020K	0.200	0.020K	0.002K
	12	45 0005	13.3	7.8		689	8.70	374	0.020K	0.200	0.020K	0.002K
	12	45 0009	13.2	7.8		690	8.80	370	0.020K	0.200	0.020K	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/14	11	10 0000	0.017	0.5	
	11	10 0005	0.013		
75/08/06	08	05 0000	0.010	0.5	
	08	05 0005	0.012		
	08	05 0009	0.011		
75/09/19	12	45 0000	0.022	0.5	
	12	45 0005	0.023		
	12	45 0009	0.021		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

490102
42 03 03.0 111 16 29.0 3
BEAR LAKE
16007 UTAH

150791

11EPALES 2111202
0050 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/14	11	40 0000	8.7	9.4	96	510	8.75	310	0.030	0.300	0.020K	0.015
	11	40 0005	5.9	10.0		474	8.80	364	0.020	0.200	0.020K	0.006
	11	40 0010	5.2	10.0		465	8.80	370	0.020	0.200	0.020K	0.007
	11	40 0020	4.7	10.1		450	8.80	398	0.020	0.200	0.020K	0.013
	11	40 0045	4.2	10.0		454	8.80	396	0.020	0.200K	0.020K	0.006
75/08/06	08	35 0000	21.3	6.8	300	673	8.80	312	0.020	0.200	0.020K	0.005
	08	35 0005	21.4	7.0		673	8.80	356	0.020K	0.200	0.020K	0.002
	08	35 0015	21.4	7.0		677	8.80	360	0.020	0.200	0.020K	0.002K
	08	35 0035	19.7	7.6		695	8.80	312	0.020	0.200	0.020K	0.002K
	08	35 0055	13.4	8.0		565	8.80	360	0.020K	0.200	0.020K	0.002K
	08	35 0079	9.1	8.8		505	8.80	340	0.020K	0.200	0.020K	0.002K
75/09/19	12	15 0000	14.5	8.0	246	717	8.80	388	0.020K	0.200K	0.020K	0.003
	12	15 0005	14.4	7.4		707	8.80	372	0.020K	0.200	0.020K	0.003
	12	15 0025	14.2	8.0		704	8.80	382	0.020K	0.200K	0.020K	0.002
	12	15 0048	13.8	8.8		696	8.70	392	0.020K	0.200K	0.020K	0.002K
	12	15 0075	7.2	7.4		588	8.60	392	0.020K	0.200K	0.020K	0.002K
	12	15 0106	3.7	7.6		541	8.80	386	0.020K	0.200	0.020K	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/14	11	40 0000	0.015	0.7	
	11	40 0005	0.014		
	11	40 0010	0.011		
	11	40 0020	0.010		
	11	40 0045	0.010		
75/08/06	08	35 0000	0.016	0.6	
	08	35 0005	0.010		
	08	35 0015	0.010		
	08	35 0035	0.010		
	08	35 0055	0.011		
	08	35 0079	0.011		
75/09/19	12	15 0000	0.021	0.7	
	12	15 0005	0.020		
	12	15 0025	0.022		
	12	15 0048	0.029		
	12	15 0075	0.029		
	12	15 0106	0.033		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

490103
42 01 48.0 111 21 38.0 3
BEAR LAKE
16007 UTAH

150791

11EPALES 2111202
0028 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/14	12 30	0000	5.8	10.0	132	479	8.80	372	0.030	0.300	0.020K	0.040
	12 30	0005	4.5	10.0		457	8.80	364	0.020	0.200K	0.040	0.003
	12 30	0015	4.1	10.4		454	8.80	384	0.020K	0.300	0.020K	0.002
	12 30	0024	3.7	10.0		450	8.80	406	0.020	0.300	0.020K	0.006
75/08/06	09 05	0000	21.1	7.0	276	670	8.85	378	0.020K	0.200	0.020K	0.002K
	09 05	0005	21.1	7.0		670	8.90	358	0.020K	0.300	0.020K	0.002K
	09 05	0015	20.7	7.4		661	8.85	344	0.020K	0.300	0.020K	0.003
	09 05	0026	19.0	7.4		645	8.85	370	0.020K	0.300	0.020K	0.002
75/09/19	11 50	0000	14.5	9.0	180	741	8.80	392	0.020K	0.200K	0.020K	0.004
	11 50	0005	14.4	7.6		710	8.80	374	0.020K	0.200K	0.020K	0.003
	11 50	0020	13.5	7.8		695	8.80	348	0.020K	0.200K	0.020K	0.003

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/14	12 30	0000	0.010	1.0	
	12 30	0005	0.009		
	12 30	0015	0.009		
	12 30	0024	0.011		
75/08/06	09 05	0000	0.011	0.6	
	09 05	0005	0.013		
	09 05	0015	0.008		
	09 05	0026	0.010		
75/09/19	11 50	0000	0.025	0.6	
	11 50	0005	0.035		
	11 50	0020	0.032		

K VALUE KNOWN TO BE LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

490104
41 59 02.0 111 18 14.0 3
BEAR LAKE
49033 UTAH

150791

11EPALES 2111202
0155 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/14	14 55	0000	7.4	10.0	144	460	8.80	386	0.020	0.500	0.020K	0.006
	14 55	0005	3.7	10.1		437	8.80	370	0.020K	0.300	0.020K	0.004
	14 55	0015	3.3	10.0		437	8.80	350	0.020K	0.300	0.020K	0.003
	14 55	0030	3.2	10.4		488	8.80	372	0.020K	0.300	0.020K	0.003
	14 55	0070	3.1	10.2		440	8.80	390	0.020K	0.300	0.020K	0.003
	14 55	0110	3.1	10.0		440	8.80	386	0.020K	0.400	0.020K	0.005
	14 55	0152	3.1	10.0		436	8.80	358	0.020K	0.400	0.020K	0.005
75/08/06	09 30	0000	21.1		360	670	8.90	330	0.020K	0.200	0.020K	0.002
	09 30	0005	21.2	7.4		670	8.90	364	0.020K	0.200	0.020K	0.002K
	09 30	0015	21.2	7.6		669	8.90	346	0.020K	0.200	0.020K	0.002K
	09 30	0035	20.0	7.4		653	8.90	360	0.020K	0.200K	0.020K	0.002K
	09 30	0055	11.6			543	8.80	332	0.020K	0.200K	0.020K	0.005
	09 30	0080	6.5	8.4		477	8.75	340	0.020K	0.200K	0.020K	0.004
	09 30	0110	6.0	9.0		471	8.75	356	0.020K	0.200K	0.020K	0.003
	09 30	0143	5.6	8.2		469	8.65	364	0.020K	0.200K	0.020K	0.003
75/09/19	11 20	0000	14.5	8.2	240	713	8.80	374	0.020K	0.200K	0.020K	0.002K
	11 20	0005	14.4	7.8		710	8.80	392	0.020K	0.200K	0.020K	0.002K
	11 20	0025	14.4	8.0		708	8.80	374	0.020K	0.200K	0.020K	0.002K
	11 20	0050	14.2	7.8		698	8.80	378	0.020K	0.200K	0.020K	0.002K
	11 20	0069	4.3	8.2		550	8.55	392	0.020K	0.200K	0.020K	0.002K
	11 20	0110	2.8	7.8		528	8.50	376	0.020K	0.200K	0.020K	0.002K
	11 20	0156	2.5	7.2	180	533	8.55	378	0.020K	0.200K	0.020K	0.004

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

490104
41 59 02.0 111 18 14.0 3
BEAR LAKE
49033 UTAH

150791

11EPALES 2111202
0155 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/14	14	55 0000	0.011	1.0	
	14	55 0005	0.009		
	14	55 0015	0.009		
	14	55 0030	0.008		
	14	55 0070	0.009		
	14	55 0110	0.117		
	14	55 0152	0.054		
75/08/06	09	30 0000	0.007	0.6	
	09	30 0005	0.008		
	09	30 0015	0.008		
	09	30 0035	0.010		
	09	30 0055	0.009		
	09	30 0080	0.011		
	09	30 0110	0.009		
	09	30 0143	0.010		
75/09/19	11	20 0000	0.019	1.3	
	11	20 0005	0.018		
	11	20 0025	0.026		
	11	20 0050	0.022		
	11	20 0069	0.031		
	11	20 0110	0.024		
	11	20 0156	0.012		

STORET RETRIEVAL DATE 76/05/10

490105
41 58 26.0 111 21 28.0 3
BEAR LAKE
49033 UTAH

150791

11EPALES 2111202
0106 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/14	15 40	0000	7.2	10.0	148	487	8.80	374	0.020K	0.400	0.020K	0.011
	15 40	0005	4.8	10.2		462	8.80	374	0.020K	0.300	0.020K	0.003
	15 40	0015	3.8	10.4		451	8.80	390	0.020K	0.200	0.020K	0.003
	15 40	0030	3.6	10.4		448	8.80	378	0.020	0.300	0.020K	0.007
	15 40	0055	3.5	10.4		448	8.80	390	0.020	0.200K	0.020K	0.005
	15 40	0102	3.4	10.0		448	8.80	374	0.020	0.200	0.020K	0.004
75/08/06	11 30	0000	21.3	7.6	288	670	8.90	336	0.020K	0.200K	0.020K	0.003
	11 30	0005	21.0	7.0		671	8.90	366	0.020	0.200K	0.020K	0.004
	11 30	0020	21.0	6.1		670	8.90	344	0.020K	0.200K	0.020K	0.002
	11 30	0045	14.4	9.4		576	8.90	360	0.030	0.200K	0.020K	0.005
	11 30	0070	7.9	9.6		496	8.80	500	0.020	0.200K	0.020K	0.004
	11 30	0098	6.3	8.0		436	8.75	490	0.020	0.200K	0.020K	0.004
75/09/19	10 45	0000	14.3	5.8	216	711	8.80	368	0.020K	0.200K	0.020K	0.002
	10 45	0005	14.3	8.0		709	8.80	386	0.020K	0.200K	0.020K	0.003
	10 45	0030	14.3	7.6		709	8.80	372			0.020K	0.002
	10 45	0066	10.5	10.0		635	8.60	354	0.020K	0.200K	0.020K	0.002
	10 45	0100	3.4	7.8		541	8.80	374	0.020K	0.200K	0.020K	0.002

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/14	15 40	0000	0.014	0.8	
	15 40	0005	0.009		
	15 40	0015	0.009		
	15 40	0030	0.011		
	15 40	0055	0.012		
	15 40	0102	0.010		
75/08/06	11 30	0000	0.008	0.6	
	11 30	0005	0.008		
	11 30	0020	0.007		
	11 30	0045	0.008		
	11 30	0070	0.007		
	11 30	0098	0.016		
75/09/19	10 45	0000	0.024	1.0	
	10 45	0005	0.021		
	10 45	0066	0.023		
	10 45	0100	0.020		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

490106
41 51 23.0 111 19 44.0 3
BEAR LAKE
49033 UTAH

150791

11EPALES 2111202
0085 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/15	10 45	0000	6.8	8.4	180	490	8.35	318	0.020	0.300	0.020	0.006
	10 45	0005	5.1	10.4		472	8.60	348	0.020K	0.300	0.020K	0.005
	10 45	0020	4.1	9.8		457	8.60	344	0.020	0.300	0.020K	0.005
	10 45	0035	3.9	10.2		454	8.70	362	0.020K	0.300	0.020K	0.006
	10 45	0050	3.9	9.9		450	8.70	358	0.020K	0.300	0.020K	0.005
	10 45	0081	3.9	9.8		454	8.70	364	0.020K	0.400	0.020K	0.006
75/08/06	13 30	0000	21.0	7.4	600	670	8.95	505	0.020	0.200K	0.020K	0.007
	13 30	0005	20.8	7.4		667	8.90	402	0.030	0.200K	0.020K	0.008
	13 30	0025	19.8	7.4		650	8.95	402	0.020K	0.200K	0.020K	0.009
	13 30	0050	10.8	9.4		525	8.90	375	0.030	0.200K	0.020K	0.007
	13 30	0081	6.8	8.2		485	8.85	370	0.020	0.200	0.020K	0.009
75/09/19	09 55	0000	14.4	8.8	150	714	8.70	396	0.020K	0.200K	0.020K	0.002K
	09 55	0005	14.4	7.6		714	8.80	374	0.020K	0.200	0.020K	0.002K
	09 55	0030	14.4	8.0		712	8.80	355	0.020K	0.200K	0.020K	0.002K
	09 55	0050	14.4	7.8		711	8.80	404	0.020K	0.200K	0.020K	0.002K
	09 55	0060	7.3	7.6		583	8.60	350	0.020K	0.200K	0.020K	0.003
	09 55	0079	3.9	7.6		552	8.80	400	0.020K	0.200K	0.020K	0.002K

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/15	10 45	0000	0.012	1.1	
	10 45	0005	0.011		
	10 45	0020	0.011		
	10 45	0035	0.012		
	10 45	0050	0.012		
	10 45	0081	0.022		
75/08/06	13 30	0000	0.007	0.7	
	13 30	0005	0.011		
	13 30	0025	0.010		
	13 30	0050	0.009		
	13 30	0081	0.014		
75/09/19	09 55	0000	0.026	1.1	
	09 55	0005	0.022		
	09 55	0030	0.021		
	09 55	0050	0.020		
	09 55	0060	0.026		
	09 55	0079	0.021		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

490107
41 55 01.0 111 21 59.0 3
BEAR LAKE
49033 UTAH

150791

11EPALES 2111202
0090 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
75/05/15	11	20 0000	7.6	10.2	168	506	8.70	398	0.020K	0.300	0.020K	0.006
	11	20 0005	5.5	10.0		480	8.70	374	0.020K	0.200	0.020K	0.005
	11	20 0025	3.9	10.2		458	8.70	346	0.020K	0.300	0.020K	0.006
	11	20 0040	3.8	10.0		454	8.70	360	0.020K	0.300	0.020K	0.005
	11	20 0060	3.7	10.2		454	8.70	368	0.020K	0.300	0.020K	0.006
	11	20 0086	3.6	10.2		454	8.70	370	0.020K	0.300	0.020K	0.006
75/08/06	11	55 0000	20.9	7.2	276	666	8.90	406	0.020K	0.200	0.020K	0.002K
	11	55 0005	21.0	7.0		670	9.00	398	0.020	0.200K	0.020K	0.002K
	11	55 0015	20.7	7.4		664	9.00	505	0.020	0.200K	0.020K	0.002K
	11	55 0030	20.0	7.6		632	9.00	392	0.020	0.200	0.020K	0.002K
	11	55 0045	7.3	8.8		557	8.95	398	0.020	0.200K	0.020K	0.002K
	11	55 0078	7.0	7.8		482	8.85	550	0.020	0.200K	0.020K	0.002K
75/09/19	10	20 0000	14.5	9.2	192	719	8.80	404	0.020K	0.200K	0.020K	0.002K
	10	20 0005	14.5	7.8		714	8.80	400	0.020K	0.200K	0.020K	0.002
	10	20 0035	14.3	8.0		713	8.80	360	0.020K	0.200K	0.020K	0.002K
	10	20 0057	6.3	8.6		582	8.60	374	0.020K	0.200K	0.020K	0.002K
	10	20 0085	4.3	8.6		557	8.60	396	0.020K	0.200K	0.020K	0.003
												0.004

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
75/05/15	11	20 0000	0.009	1.0	
	11	20 0005	0.010		
	11	20 0025	0.011		
	11	20 0040	0.010		
	11	20 0060	0.010		
	11	20 0086	0.011		
75/08/06	11	55 0000	0.010		
	11	55 0005	0.007		
	11	55 0015	0.007		
	11	55 0030	0.007		
	11	55 0045	0.007		
	11	55 0078	0.014		
75/09/19	10	20 0000	0.023	1.2	
	10	20 0005	0.027		
	10	20 0035	0.019		
	10	20 0057	0.030		
	10	20 0085	0.035		

K VALUE KNOWN TO BE LESS THAN INDICATED

APPENDIX E

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/05/10

4901A1
42 07 22.0 111 18 55.0 4
UNNAMED OUTLET
49 7.5 BEAR LAKE N
O/BEAR LAKE 150791
HWY 557/353 BRDG 500 FT WSW OF LIFTON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/19	14	40	0.024	1.300	0.020	0.005K	0.020
75/01/13	12	05	0.008	0.500	0.005K	0.005K	0.010K
75/02/28	18	00	0.216	2.200	0.056	0.024	0.040
75/04/14	19	30	0.005	1.100	0.145	0.010	0.040
75/05/05	11	30	0.005	0.850	0.026	0.005	0.010K
75/06/09	18	30	0.010	2.100	0.260	0.005	0.070
75/06/25	10	20	0.015	0.800	0.055	0.010	0.060
75/07/11	13	15	0.010	0.600	0.020	0.005	0.030
75/07/23	10	30	0.015	0.550	0.005K	0.010	0.030
75/09/19	11	30	0.005	0.400	0.035	0.045	0.045

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

4901A2
41 50 40.0 111 19 40.0 4
BIG CREEK
49 7.5 LAKETOWN
T/BEAR LAKE 150791
ST RT 145 BRDG 1.5 MI NW OF LAKETOWN
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	12	45	0.490	0.600	0.040	0.020	0.030
74/12/14	11	50	0.224	0.300	0.050	0.010	0.020
75/01/11	10	00	0.248	0.200	0.070	0.015	0.030
75/02/08	09	05	0.850	0.500	0.072	0.020	0.030
75/03/08	09	00	0.088	1.580	0.202	0.032	0.130
75/04/05	08	40	0.105	2.200	0.045	0.020	0.140
75/05/03	08	30	0.085	1.000	0.135	0.020	0.100
75/05/17	11	00	0.030	1.500	0.050	0.020	0.060
75/06/09	07	55	0.020	1.550	0.035	0.040	0.140
75/06/16	12	25	0.010	1.550	0.020	0.045	0.150
75/07/12	08	30	0.010	1.250	0.030	0.045	0.100
75/08/09	07	10	0.005	0.450	0.020	0.015	0.050
75/09/12	11	30	0.005	1.500	0.020	0.065	0.110
75/10/03	12	00	0.035	0.600	0.010	0.010	0.080

STORET RETRIEVAL DATE '76/05/10

4901C1
42 05 37.0 111 15 25.0 4
INDIAN CREEK
49 7.5 BEAR LAKE N
T/BEAR LAKE 150791
HWY 557/353 BRDG 1 MI S OF TURNPIKE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/19	15	15	1.760	0.900	0.025	0.005	0.080
74/11/24	18	40	1.830	1.800	0.035	0.010	0.080
74/12/08	16	00	1.680	1.600	0.025	0.010	0.130
75/01/13	12	20	1.440	0.650	0.012	0.010	0.120
75/02/28	18	15	1.400	5.200	0.160	0.216	2.000
75/03/22	12	30	1.450	1.000	0.022	0.025	0.420
75/04/14	20	00	1.880	2.750	0.045	0.035	0.235
75/05/05	11	45	1.950	1.300	0.070	0.005K	0.110
75/06/09	11	00	1.800	1.850	0.045	0.020	0.270
75/06/25	10	00	2.200	0.800	0.010	0.030	0.270
75/07/11	13	40	2.300	0.850	0.020	0.020	0.210
75/07/23	10	00	2.100	1.400	0.005K	0.015	0.160
75/08/04	20	15	2.100		0.105	0.005K	
75/09/19	12	00	2.600	1.400	0.045	0.010	0.090

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

490101
41 59 14.0 111 15 48.0 4
UNNAMED STRM N EDEN CYN
49 7.5 BEAR LAKE S
T/BEAR LAKE 150791
HWY 557/353 BRDG .8 MI S OF RICH CO LINE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	13	25	0.128	0.900	0.040	0.055	0.150
74/12/14	12	40	0.072	0.400	0.010	0.045	0.090
75/03/08	09	40	0.024	0.450	0.012	0.044	0.070
75/04/04	09	30	0.015	0.475	0.040	0.050	0.090
75/05/03	09	15	0.030	1.000	0.035	0.060	0.120
75/05/17	09	50	0.005	0.600	0.025	0.060	0.080
75/06/15	08	45	0.005	0.500	0.010	0.075	0.110
75/06/16	12	10	0.005	0.800	0.010	0.080	0.120
75/07/12	09	10	0.040	0.350	0.030	0.070	0.070
75/08/09	20	10	0.020	0.500	0.015	0.055	0.070
75/09/12	11	00	0.032	0.200	0.010	0.050	0.060
75/10/03	12	40	0.020	0.300	0.005	0.040	0.070

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STORET RETRIEVAL DATE 76/05/10

4901E1
41 55 25.0 111 16 55.0 4
UNNAMED STREAM
49 7.5 BEAR LAKE S
T/BEAR LAKE 150791
SEC RD BRDG .1 MI W OF NEBEKER RANCH
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	13	35	0.352	1.000	0.045	0.025	0.230
75/04/05	09	20	0.120	0.900	0.037	0.005	0.190
75/05/03	09	10	0.185	1.050	0.025	0.020	0.390
75/05/17	11	30	0.175	0.950	0.030	0.005K	0.170
75/06/16	08	30	0.195	1.000	0.015	0.010	0.150
	12	20	0.170	0.950	0.020	0.005	0.140
75/07/12	09	00	0.035	0.050K	0.010	0.010	0.020
75/08/09	20	00	0.005	0.700	0.015	0.015	0.160

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

490161
41 59 06.0 111 24 35.0 4
SWAN CREEK
49 7.5 GARDEN CITY
T/BEAR LAKE 150791
US RT 89 BRDG .2 MI W OF LAKOTA
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	11 30		0.192	0.300	0.020	0.015	0.020
74/12/14	11 40		0.172	0.100K	0.005K	0.010	0.020
75/01/13	10 40		0.200	0.100K	0.020	0.010	0.010
75/02/08			0.200	0.300	0.016	0.016	0.016
75/03/08	08 40		0.176	0.050K	0.024	0.012	0.015
75/04/05	10 10		0.140	0.600	0.015	0.015	0.040
75/05/02	08 10		0.185	0.050K	0.010	0.010	0.020
75/05/17	10 30		0.315	0.250	0.010	0.015	0.020
75/06/16	07 30		0.210	0.050	0.007	0.020	0.040
	12 00		0.220	0.150	0.010	0.020	0.030
75/07/12	20 00		0.160	0.300	0.005K	0.025	0.025
75/08/09	11 00		0.165	0.100	0.005	0.020	0.020
75/09/12	12 00		0.160	0.400	0.005	0.020	0.070
75/10/03	11 40		0.175	0.100K	0.005K	0.015	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

4901M1
42 02 05.0 111 23 45.0 4
FISH HAVEN CREEK
49 7.5 ST CHARLES
T/BEAR LAKE 150791
US RT 89 BRDG 3.5 MI S ST CHARLES
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/19	14 05		0.064	0.200	0.010	0.020	0.030
74/11/24	18 10		0.140	1.200	0.025	0.015	0.020
74/12/08	15 30		0.168	0.700	0.025	0.010	0.020
75/01/13	11 40		0.168	0.250	0.010	0.010	0.010
75/02/28	17 30		0.128	0.650	0.040	0.024	0.024
75/03/22	11 50		0.135	0.900	0.030	0.024	0.024
75/04/14	18 30		0.080	0.700	0.035	0.030	0.030
75/05/05	11 00		0.145	0.750	0.035	0.010	0.010
75/06/09	11 00		0.100	1.050	0.025	0.045	0.080
75/06/25	12 00		0.100	0.100	0.010	0.050	0.070
75/07/11	12 30		0.065	0.100	0.010	0.030	0.030
75/07/23	11 20		0.095	0.450	0.005K	0.035	0.040
75/08/04	19 30		0.065	1.200	0.040	0.040	0.060
75/09/19	11 00		0.080	1.100	0.030	0.025	0.120

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

4901M2
42 02 50.0 111 27 05.0 4
FISH HAVEN CREEK
49 7.5 ST CHARLES
T/BEAR LAKE 150791
RD XING 3 MI W OF JCT W HWY 89 AT FISH H
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/19	13	30	0.072	0.700	0.020	0.015	0.015
74/11/24	18	00	0.110	1.800	0.025	0.015	0.015
74/12/08	15	00	0.128	0.500	0.032	0.015	0.020
75/01/13	11	20	0.128	0.300	0.005K	0.015	0.012
75/02/28	17	45	0.112	0.600	0.032	0.024	0.040
75/03/22	11	10	0.104	0.900	0.009	0.008	0.030
75/04/14	18	00	0.085	1.500	0.095	0.015	0.010K
75/05/05	10	30	0.160	0.450	0.020	0.020	0.020
75/06/09	17	30	0.080	0.900	0.015	0.035	0.080
75/06/25	11	30	0.085	0.150	0.005K	0.035	0.060
75/07/11	12	00	0.065	0.150	0.020	0.035	0.040
75/07/23	11	14	0.075	0.150	0.005K	0.025	0.030
75/08/04	19	00	0.090	1.050	0.015	0.015	0.030
75/09/19	10	30	0.085	0.500	0.015	0.020	0.060

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

4901J1
42 07 07.0 111 23 18.0 4
LITTLE CREEK
49 7.5 ST CHARLES
T/BEAR LAKE 150791
US RT 89 BRDG JUST IN CTY LIM OF ST CHAS
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/10/19	14	20	0.104	0.600	0.030	0.010	0.020
74/11/24	18	20	0.096	0.775	0.015	0.010	0.010K
74/12/08	15	40	0.120	0.900	0.020	0.005	0.010K
75/01/13	12	00	0.144	0.400	0.005K	0.010	0.025
75/02/28	17	50	0.064	0.800	0.032	0.024	0.100
75/03/22	12	10	0.120	0.600	0.015	0.010	0.010K
75/04/14	19	00	0.065	1.200	0.035	0.005	0.010K
75/05/05	11	15	0.160	0.800	0.100	0.010	0.020
75/06/09	08	15	0.070	1.000	0.010	0.015	0.040
75/06/25	11	00	0.110	0.200	0.015	0.015	0.050
75/07/11	13	00	0.085	0.150	0.045	0.015	0.015
75/07/23	11	45	0.120	1.350	0.010	0.015	0.020
75/08/04	19	40	0.070	2.400	0.030	0.010	0.015
75/08/16	10	00	0.045	0.500	0.180	0.005K	0.020
75/09/19	11	30	0.125	0.600	0.015	0.015	0.080

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/05/10

4901K1
41 49 00.0 111 18 50.0 4
UNNAMED CRK LAKETWN CYN
49 7.5 LAKETOWN
T/BEAR LAKE 150791
LGHT DTY RD XING .3 MI S OF LAKETOWN
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/11/09	12 55		0.224	0.800	0.025	0.010	0.010
74/12/14	12 05		0.304	0.100	0.020	0.005	0.020
75/03/08	09 15		0.176	0.150	0.012	0.008	0.020
75/04/05	09 00		0.060	1.700	0.015	0.005K	0.040
75/05/05	08 45		0.010	0.250	0.025	0.005	0.030
75/05/17	11 10		0.025	0.950	0.025	0.015	0.080
75/06/16	12 40		0.185	0.300	0.015	0.010	0.060
75/10/03	12 10		0.240	0.100K	0.015	0.005K	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED